MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

ECE3136 – JAVA TECHNOLOGY

(All Sections / Groups)

20 OCTOBER 2018
2:30 P.M – 4:30 P.M.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This examination paper consists of FIVE (5) pages including cover with THREE (3) questions only.
2. Answer ALL questions. All questions carry 25 marks and the distribution of the marks for each question is given.
3. This examination is OPEN-BOOK. Allowed material: Textbook and/or bound notes only.
4. Please print all your answers in the Answer Booklet provided.

Question 1

Entrance tickets to a theme park cost $50.00 each for adults and $25.00 each for children. If the total cost of tickets purchased is $150.00 or more, a 25% discount is given.

Write a Java application class, `TicketSales`, to allow the user to repeatedly enter the number of adult and child tickets required, then compute and display the total cost of the purchase. The park does not allow unaccompanied children in it. Therefore, child tickets cannot be purchased if no adult tickets are included. If the number of adult tickets entered is zero, display the message: "Children are not allowed in the park without an accompanying adult". Use a loop that repeats indefinitely. See Figure Q1.

[18 marks]

Format the output displayed according to their nature (currency or percentage).

[3 marks]

Handle all exceptions that may occur.

[4 marks]

```
Enter number of adults: 1
Enter number of children: 2
Total: $100.00
Purchase another? (y/n): y
Enter number of adults: 2
Enter number of children: 3
Total: $175.00
Discount: 25%
Total: $131.25
Purchase another? (y/n): y
Enter number of adults: 0
Children are not allowed in the park without an accompanying adult
Enter number of adults: 1
Enter number of children: 1
Total: $75.00
Purchase another? (y/n): n
```

Figure Q1: Sample output

Continued...

Question 2

Write a program that changes the look of the text and background in a frame.

Your program should contain the following:

(a) The class `ChangePanel` which inherits from `JPanel` and implements `ActionListener`. It has 2 panels which are arranged using the vertical `BoxLayout`. The top panel has a label with the words "Change Me". The bottom panel has a textfield, 2 buttons and 2 checkboxes. Instantiate the textfield to have the same initial text "Change Me". Layout as shown in Figure Q2a.

[11 marks]

(b) Attach an `ActionListener` to the buttons and textfield. This `ActionListener` is the class `ChangePanel` itself. Provide the logic in the `actionPerformed` method so that the listener:

a. listens for updates to the textfield and changes the text in the label
b. gets the button that is pressed and updates the background colour of the top panel accordingly.

[7 marks]

(c) Attach an `ItemListener` to the checkboxes. Provide the logic in the listener so that the listener updates the label font accordingly. The bold and italic styles can be stacked meaning the font can be bold and italic at the same time.

[5 marks]

Figure Q2b shows the interface after the text, text styles and background colour have been changed.

(d) Write a main method that creates a frame containing an instance of the `ChangePanel`.

[2 marks]

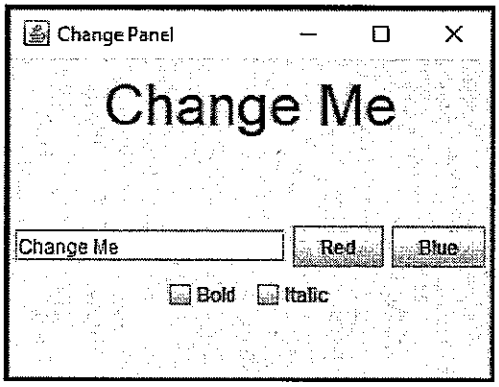

Figure Q2a: Interface

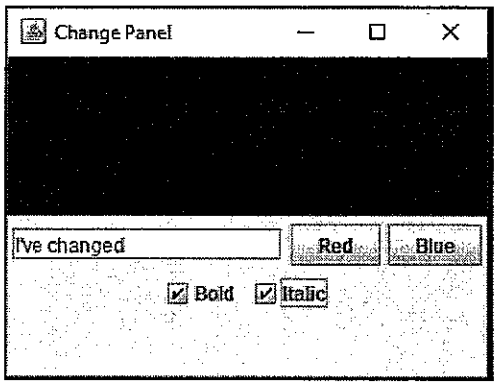

Figure Q2b: After changes applied

Continued...

Question 3

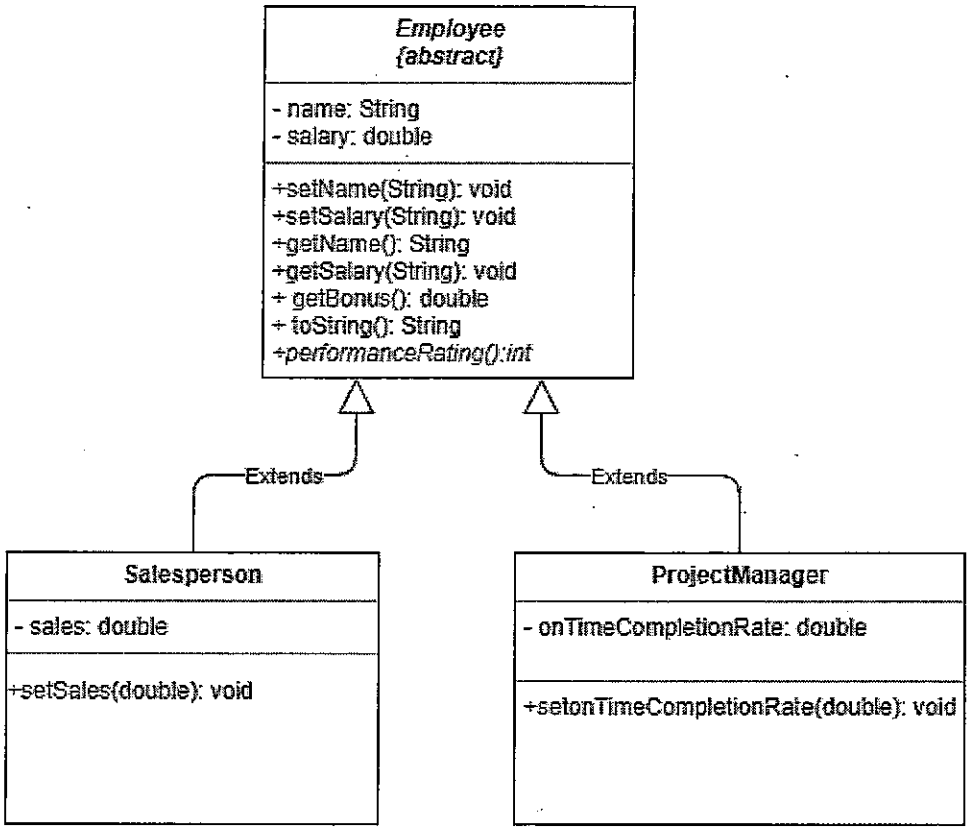

Figure Q3a: UML diagram

Based on the UML diagram in Figure Q3a, do the following:

(a) Write abstract class `Employee`. Method `getBonus` calculates the bonus. The bonus of an employee is determined by their rating. Table Q3a shows the bonus.

Performance Rating	Bonus
1	0
2	1.5 x Salary
3	2.5 x Salary

Table Q3a

[11 marks]

(b) Write a class, `SalesPerson`, which inherits from `Employee`. The class has an attribute, `sales`, which is type double and represents the amount of sales the person has made. Provide a constructor. Define the inherited method, `performanceRating`. The performance of a salesperson is determined by the amount of sales. Table Q3b shows the ratings.

Sales Amount	Performance Rating
Less than $20,000	1

Continued...

$20,000 - $49,999	2
$50,000 or more	3

Table Q3b

[5.5 marks]

(c) Write a class, `ProjectManager`, which inherits from `Employee`. The class has an attribute, `onTimeCompletionRate`, which is a value between 0.0 and 1.0 (inclusive) and represents the rate of projects that are completed on time. Provide a constructor. Define the inherited method, `performanceRating`. The performance of a project manager is determined by the project on-time completion rate. Table Q3c shows the ratings.

Project On-Time Completion Rate	Performance Rating
Less than 0.7	1
0.7 or more, less than 0.9	2
0.9 or more	3

Table Q3c

[5.5 marks]

(d) Based on the output from the driver program in Figure Q3b, fill in the blanks (i), (ii) and (iii). Use object `tmp` for (ii) and (iii).

[3 marks]

```
_____(i)_____ tmp;
tmp = new SalesPerson ("Sally", 3500, 21000);
System.out.println("Salesperson bonus is: " + ___(ii)_____);
tmp = new ProjectManager ("Paul", 4500, 0.8);
System.out.println("Project Manager bonus is:"+____(iii)___);
```

```
Salesperson bonus is:5250.0
Project Manager bonus is:6750.0
```

Figure Q3b: Output

End of Paper